The United States has ratified this STANAG and it is approved for use. Actual promulgation by NATO is expected within one year. At that time, this document will be replaced by the promulgated version. Any U.S. comments or reservations are included in the following letter.

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND
TECHNOLOGY

June 10, 2002

MEMORANDUM FOR U.S. MISSION TO NATO, ARMAMENTS COOPERATION DIVISION
(ARMY ARMAMENTS OFFICER), PSC 81, APO AE 09724

SUBJECT: Draft STANAG 4241 (EDITION 2) – "BULLET IMPACT, MUNITION TEST PROCEDURE "

Reference document, AC/310-D/195, 12 December 2001, SAB.

The U.S. Armed Forces ratifies the referenced agreement.

Ratification and implementation details are as follows:

	IMPLEMENTATION					
	Forecast Date			Actual Date		
RATIFICATION REFERENCE	NAVY	ARMY	AIR FORCE	NAVY	ARMY	AIR FORCE
Memo, OUSD(A&T) DATED AS ABOVE	June 10, 2002			June 10, 2002		

NATIONAL IMPLEMENTING DOCUMENT: MIL-STD-2105C

RESERVATIONS: None

COMMENTS: Paragraph 1.a. must be changed from "..calibre 0.50mm.." to "..calibre 0.50..". This is an obvious typographic error.

The point of contact is Mr. James E. Elliott, DSN 880-3047, commercial (973) 724-3047.

Anthony J. Melita
U.S. Key Delegate
AC/310 Main Group

CF:

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Mr. Chris Janow, U.S. Army Armament Research, Development & Engineering Center (ARDEC), AMSTA-AR-CCZ, Picatinny Arsenal, NJ 07806-5000

Mr. Stephen N. Tanner, Naval Air Warfare Center, Code 476400D, China Lake, CA 93555-6001

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Mr. Homesh Lalbahadur, U.S. Army Armament Research, Development & Engineering Center (ARDEC), AMSTA-AR-CCF-D, Picatinny Arsenal, NJ 07806-5000

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HQUSAF/SAF/IAQ, 1500 Wilson Blvd, 9th Floor, Arlington, VA. 22209

Mr. R. Sladden, Armaments CO-Operation Section, Defence Support Division, NATO Headquarters, Avenue Leopold III, 1110 Brussels, Belgium

NORTH ATLANTIC COUNCIL
CONSEIL DE L'ATLANTIQUE NORD

NATO/PfP UNCLASSIFIED

12 December 2001

DOCUMENT
AC/310-D/195

**GROUP ON SAFETY AND SUITABILITY FOR SERVICE (S3)
OF MUNITIONS AND EXPLOSIVES (AC/310)**

CNAD PARTNERSHIP GROUP (CPG)

RATIFICATION DRAFT 1 - STANAG 4241 (EDITION 2) BULLET IMPACT, MUNITION TEST PROCEDURES

Memorandum by the Assistant Secretary General for Defence Support

(RATIFICATION REQUEST)

Reference: PfP(CPG-S/3-SG/3)DS/8 dated 30 November 2001

1. The Group on Safety and Suitability for Service of Munitions and Explosives, Sub-Group 3, approved, at reference, draft STANAG 4241 (Edition 2) for issue for ratification.

2. In line with the decision of the Group, the agreed text is herewith forwarded to delegations of NATO nations who are requested to obtain the national ratification by 15 June 2002. The delegations are asked to inform the Defence Support Division of their national Ratification references, together with a statement of the date by which national implementation is intended to be effective, using the ratification response form at Annex. The service or services within which the standard applies should be indicated.

3. Most national Ministries of Defence contain a standardization office or standardization liaison officer who can give advice on the procedure to be adopted to obtain a formal ratification reference. It is recommended that contact be made with that office.

4. As soon as sufficient ratifications have been received, this STANAG will be forwarded for promulgation.

(Signed) R. G. BELL

Enclosure: 1 Annex — Stanag 4241 (Edition 2)

Action Officer: R. Sladden
Original: English

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ANNEX to
AC/310-D/195

STANAG 4241
(Edition 2)
(Ratification Draft 1)

NATIONAL REPLY ON THE RATIFICATION AND IMPLEMENTATION OF A STANAG

(National Reference and Date)

To : Assistant Secretary General for Defence Support
NATO/OTAN

Subject : STANAG 4241 (Edition 2) - RATIFICATION DRAFT 1 – BULLET IMPACT, MUNITION TEST PROCEDURES

Reference : AC/310-D/195 dated 12 December 2001

1. (*nation*) ratifies/does not ratify(*) the agreement received under cover reference.

2. Ratification and implementation details are as follows:

RATIFICATION REFERENCE AND DATE	IMPLEMENTATION					
	Forecast Date			Actual Date		
	NAVY	ARMY	AIR	NAVY	ARMY	AIR

3. NATIONAL IMPLEMENTING DOCUMENT(s):

4. RESERVATIONS:

5. OTHER INFORMATION:

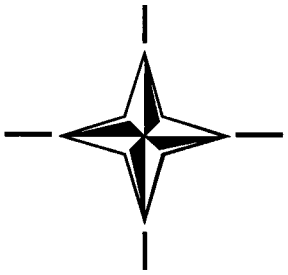
.....
(Signature block)

(*) Delete as appropriate

Enclosure to
AC/310-D/195

STANAG 4241
(Edition 2)
(Ratification Draft 1)

NORTH ATLANTIC TREATY ORGANIZATION
(NATO)



NATO STANDARDIZATION AGENCY
(NSA)

STANDARDIZATION AGREEMENT
(STANAG)

SUBJECT: BULLET IMPACT, MUNITION TEST PROCEDURES

Promulgated on 2001

Jan H ERIKSEN
Rear Admiral, NONA
Director, NSA

Enclosure to
AC/310-D/195

STANAG 4241
(Edition 2)
(Ratification Draft 1)

RECORD OF AMENDMENTS

No.	Reference/date of amendment	Date entered	Signature

EXPLANATORY NOTES

AGREEMENT

1. This NATO Standardization Agreement (STANAG) is promulgated by the Director, NSA under the authority vested in him by the NATO Military Committee.

2. No departure may be made from the agreement without consultation with the tasking authority. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.

3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

DEFINITIONS

4. Ratification is "In NATO Standardization, the fulfilment by which a member nation formally accepts, with or without reservation, the content of a Standardization Agreement" (AAP-6).

5. Implementation is "In NATO Standardization, the fulfilment by a member nation of its obligations as specified in a Standardization Agreement" (AAP-6).

6. Reservation is "In NATO Standardization, the stated qualification by a member nation that describes the part of a Standardization Agreement that it will not implement or will implement only with limitations" (AAP-6).

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

7. Page (iii) gives the details of ratification and implementation of this agreement. If no details are shown it signifies that the nation has not yet notified the tasking authority of its intentions. Page (iv) (and subsequent) gives details of reservations and proprietary rights that have been stated.

FEEDBACK

8. Any comments concerning this publication should be directed to NATO/NSA - Bvd Leopold III, 1110 Brussels - BE.

Enclosure to
AC/310-D/195

STANAG 4241
(Edition 2)
(Ratification draft 1)

RATIFICATION AND IMPLEMENTATION DETAILS
STADE DE RATIFICATION ET DE MISE EN APPLICATION

NATION / PAYS	NATIONAL RATIFICATION REFERENCE REFERENCE DE LA RATIFICATION NATIONALE	NATIONAL IMPLEMENTING DOCUMENT DOCUMENT NATIONAL DE MISE EN APPLICATION	IMPLEMENTATION/MISE EN APPLICATION					
			INTENDED DATE OF IMPLEMENTATION DATE ENVISAGEE DE MISE EN APPLICATION			DATE IMPLEMENTATION WAS ACHIEVED DATE EFFECTIVE DE MISE EN APPLICATION		
			NAVY MER	ARMY TERRE	AIR	NAVY MER	ARMY TERRE	AIR
BE								
CA								
CZ								
DA								
FR								
GE								
GR								
HU								
IT								
LU								
NL								
NO								
PL								
PO								
SP								
TU								
UK								
US								

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RESERVATIONS/RESERVES

Enclosure to
AC/310-D/195

STANAG 4241
(Edition 2)
(Ratification draft 1)

NAVY/ARMY/AIR

NATO STANDARDIZATION AGREEMENT (STANAG)

BULLET IMPACT, MUNITION TEST PROCEDURES

Annex: None

Related Documents:

AOP-38	Glossary of Terms and Definitions Concerning the Safety and Suitability for Service of Munitions, Explosives, and Related Products
AOP-39	Guidance on the Development, Assessment and Testing of Insensitive Munitions (MURAT)
STANAG 4123	Determination of the Classification of Military Ammunition and Explosives – AASTP-3
STANAG 4439	Policy for Introduction, Assessment and Testing for Insensitive Munitions (MURAT).
United Nations Document (UN) ST/SG/AC.10/11/ Rev 3/R.256	Recommendation on the Transport of Dangerous Goods Manual of Tests and Criteria.

AIM

1. The aim of this agreement is:

   a. to provide a standard test procedure (Procedure 1) for assessing the reaction of a munition to an impact from a three-round burst of M2, calibre 0.50mm, AP projectiles;

   b. to provide an alternative, tailorable, test procedure (Procedure 2) for assessing the reaction, if any, of a munition to the impact of one or more projectiles that are typical of those determined by means of a threat hazard assessment (THA).

AGREEMENT

2. Participating nations agree:

   a. to apply this procedure to all munitions that contain explosives, propellants or pyrotechnics;

   b. to apply one of these procedures as a minimum requirement, and to continue to develop tests for other bullet attack weapons (for example, 20mm AP munition);

   c. that national orders, manuals, and instructions implementing this STANAG will include a reference to the STANAG number for purpose of identification. No departure may be made from the agreement without consultation with the tasking authority. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.

Enclosure to
AC/310-D/195

STANAG 4241
(Edition 2)
(Ratification Draft 1)

DEFINITIONS

3. For the purpose of this document, the definitions of terms to be used to describe test events are provided in AOP-38, STANAG 4439, and AOP-39.

GENERAL

4. Scope. In addition to the normal environmental and accident conditions for munitions, it is necessary to assess the likely response of munitions that may be exposed to deliberate bullet/projectile attacks. These can occur in peacetime as the result of dissident/saboteur activity, or in wartime as a consequence of enemy action. Munitions that are stowed in unsheltered stores, magazines or launchers, are considered to be particularly vulnerable. The bullet impact test can only represent a particular set of conditions, for example, it is not possible to cater to the wide range of attack weapons, sizes of fragments, strike velocities or angles of attack which may occur in the real world. The assessment takes the form of standardized trials and tests that are described in the following paragraphs.

DETAILS OF THE AGREEMENT

5. Test Selection. Two test procedures are included in this document. Procedure 1 is a standardized test and is intended as a means of jointly assessing Insensitive Munitions (IM) and, Hazard Division (HD) 1.6 requirements (see STANAG 4123, United Nations (UN) document, ST/SG/AC.10/11/ Rev.3/R.256 and STANAG 4439). Procedure 2 is tailorable and its parameters are based on the threat hazard assessment (THA). Either test shall be applied to all munitions containing explosives, propellants or pyrotechnics. When intended to satisfy both IM and Hazard Classification (HC) requirements, the test plans should be coordinated with appropriate authorities in these two areas.

6. Conditioning. If the test is to be conducted at temperatures other than ambient, assure the test item is stabilized at the required temperature before conducting the test.

7. Impact orientation. The test item shall normally be positioned with its longest axis horizontal, on a suitable stand at a height to facilitate ease of testing, but may be oriented otherwise provided the requirements of paragraph 11 are met. If necessary, the item may be strapped or restrained by other means to prevent it from becoming propulsive, but such restraint is not to interfere with instrumentation, nor significantly affect the ability of the charge or motor case to rupture or fragment.

8. Test item configuration. The test item should be in its all-up round configuration (unless otherwise identified by the THA and, for HC purposes, agreed upon by the national HC authority). The explosive items tested must be to the full production standard, although, in the case of complete munitions undergoing test, the non-explosive section of the item need only be geometrically and thermally representative. For all-up rounds that contain more than one major energetic component (such as rocket motors and warheads), the energetic components may be tested either individually or as an all-up round. If tested as an all-up round, each individual component must be subjected to the complete set of individual bullet impacts. The item may be either packaged or unpackaged, as agreed by the appropriate national authorities. Development standard items may be used if the explosive part is identical to the full production standard item, and the changes can be shown to not affect the test result. Development standard items may also be used to effect preliminary assessments of responses. Where it is assessed that the packaged item is most likely to be exposed in the service

environments (including storage, transport and processing), bullet impact tests should be conducted in the packaged configuration.

9. Safety. Stores tested in accordance with the requirements of this procedure may react with violence varying from Type V to Type I reaction or become propulsive (see AOP-39). Consequently, it is the responsibility of the agency conducting the test to ensure the safety of personnel and equipment during preparation of the test, and during and after the performance of the test.

10. Attack Munition and Firing Conditions. The standard attack munition (threat) is the M2, cal 0.50 AP round, fired from a rigidly mounted gun.

11. Target. For Procedure 1 IM tests, two tests are required, one aiming at the largest explosive component, and the other aimed at the most shock-sensitive explosive component (excluding the booster). The target shall be a 5 cm circle. For bullet impacts, a range of approximately 20-30m to the target (sufficient to assure bullet stabilization) is acceptable, the impact velocity must be adjusted to 850 $\pm$ 20 m/s, and the rate of fire shall be equivalent to 600 $\pm$ 50 rounds per min. The exact range from gun to target is to be determined by the test authorities, depending on accuracy and safety aspects. The impact shall be approximately perpendicular to the long axis of the test item. For Procedure 1, Hazard Classification (HC) tests, an additional test (a total of three tests) is performed with the booster as the target. For Procedure 2, parameters should be as determined by the THA and agreed by the appropriate authorities.

12. Observations and Records:

a. The following minimum observations are to be made and records kept:

(1) test item identification (model, serial numbers, number of test items, etc.);

(2) impact velocity and firing rate (if applicable);

(3) blast pressure in two orthogonal directions, three gauges minimum in each direction;

(4) witness plates (optional);

(5) record of events against time from the order to fire to the end of the trial;

(6) the nature of any reactions by the test item;

(7) the nature (size) and distribution of residue and debris (fragmap and recovery technique);

(8) listing of environmental preconditioning test performed;

(9) type of energetic material and weight;

(10) the orientation of the test item's longitudinal axis, and layout of the firing area;

(11) audio record (in combination with high-speed video recording);

(12) indication of propulsion (video or other suitable means);

(13) details of gun and ammunition used;

(14) record of aim point(s) selected.

b. The following photographic records and videos are to be made:

(1) still photographs of the test-item before and after each trial;

(2) still photographs of any other residues arising as a result of the trial;

(3) colour cine-film or video for the duration of each trial.

IMPLEMENTATION OF THE AGREEMENT

13. This STANAG is implemented by a nation when that nation has issued the necessary orders/instructions to its forces:

a. that all future munitions and weapon systems will be assessed / tested in accordance with this agreement;

b. to provide its NATO forces with the details in this agreement with reference to this STANAG.

14. Data developed in accordance with this STANAG shall be made available to other NATO Nations participating in a collaborative weapon development or procurement program, upon receipt of a request submitted through appropriate National channels.